AD-A039 556 TRACOR INC ROCKVILLE MD F/G 9/1
RESTORATION PROCEDURE FORMAT.(U)
APR 68
UNCLASSIFIED TRACOR-RL/68-049-U N00024-67-C-1168
NL

1 OF 1
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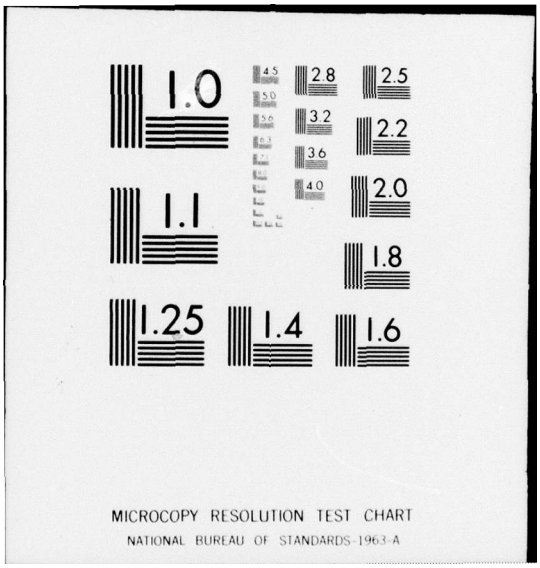
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

MOST Project 9

(15) N00024-67-C-1168

(14) TRACOR-RL/68-049-U

B.S.

ENCLOSURE 1

(6) RESTORATION PROCEDURE FORMAT,

(12) 11p.

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TRACOR SCIENCES AND SYSTEMS DIVISION
TRACOR, INC. / 627 LOFSTRAND LANE / ROCKVILLE, MARYLAND 20850 / 301-762-7070

5 April 1968

N00024-67-C-1168
Project Serial No. S2720, Task 11683
Document Number TRACOR NO. RL/68-049-U
Project Number 002-048-20

Chief, Naval Ship Systems Command
Department of the Navy
Washington, D.C. 20360

Attention: Mr. S. J. Vaida, Code 00V1D

Subject: Transducer Restoration Format

Dear Sir:

Task 2 of Contract N00024-67-C-1168 required preparation of standardized hydrophone and transducer restoration procedures for use by Transducer Repair Facilities for selected elements. The technical memorandum entitled "Transducer Restoration Handbook", TRACOR Document NO. RL/67-007-C, dated 29 March 1968, was the result of this task.

During the preparation of this handbook, it became more evident that present transducer/hydrophone restoration procedures vary in detail from essentially non-existent information to extremely detailed procedures. The formats also were not consistent or standardized.

Because of the inconsistancies and deficiencies noted above, it is recommended that all future transducer/hydrophone procurements contain a requirement to utilize the enclosed "Restoration Procedure Format", contained in Enclosure (1), as the manufacturer's guideline for the preparation of element restoration/repair procedures.

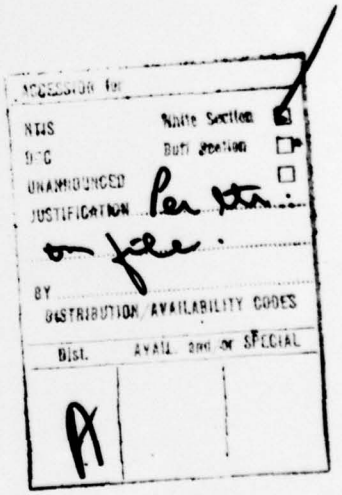
Implementation of this procedural format in element procurements will eventually result in the Navy having standardized restoration procedures suitable for use by all transducer repair facilities.

Very truly yours,

Charles L. Eversole
Program Manager

CLE:kmp

RESTORATION PROCEDURE FORMAT



SECTION 1. FUNCTIONAL DESCRIPTION

This should include a brief description of the element. The following should be included:

1. Operating frequency
2. Active element description
3. Type of fluid the element is filled with (if any)
4. Type of boot (if any)
5. Type of system used with
6. Physical dimensions
7. Any other significant design features

SECTION 2. LIST OF REFERENCES

Included here should be references to any documentation that is significantly relevant to restoration or testing of the element. The following type information should be included:

-Specification number under which the element was manufactured along with any and all waivers or agreements pertaining to it

-Contract number(s) and manufacturers under which the element was procured

-Navy microfilm reel number(s) covering the element

-References to any official letters pertaining to restoration or testing of the element

-Numbers of any reports, such as production test procedures, etc., which are used as guidelines for restoration and testing.

SECTION 3. LIST OF TEST EQUIPMENT AND MATERIALS

This section should list all necessary equipment, tools, and materials needed by the technician during the restoration of the element. Each item must be defined as to the parameters that are relevant to its usage so that equivalents may be easily defined in case that particular piece of equipment is not available. This can be done by defining side tolerances (for test equipment), dimensions, material properties, etc., (for tools, jigs, etc.), and military specifications, federal stock numbers, manufacturer's specification, etc., (for materials).

SECTION 4. REPAIRABILITY

This section defines what portions of the element are repairable and what components of it should always be replaced when making a restoration of the element. In general all accessible wiring, cable and packing glands, gaskets, O-rings, and similar items should always be replaced. Identification of the replaced items should be listed in table form so that the technician may easily gather the items before he disassembles the element. The identification should include item numbers on the parts

list (which should be on the drawing--Section 9). Further, description, quantity, and identifying numbers (FSN, Manufacturer's drawing numbers, etc.) should be included. The chart should look something like the following:

ITEM #	IDENTIFYING #	DESCRIPTION	QUANTITY
3	(FSN) 6145-752-2421	Cable - DSS-3	20 Feet
12	Type D22 (MIL-W-16878)	Wire, Black and White	18 Inches
18	EDO Part #97281	O-ring	4
	etc.		

SECTION 5. DISASSEMBLY

This should be written in a "Heath-Kit" style with item numbers from the drawing parts list included in the text wording for easy reference to the drawing. Also, direction should be given concerning what type of environment is necessary for the various stages of disassembly (white room, etc.). If any special jigs are needed or intricate details are necessary that require additional drawings, these should be referenced and included in the drawing section (Section 9).

SECTION 6. TESTS & REASSEMBLY

Included in this section are the tests necessary to determine if various subassemblies or components are acceptable for the restored elements (actually, it may be necessary, in some cases, to include these in Section 5). Examples of such tests are various ceramic

tests, (including impedance/admittance locus plots or impedometer tests, capacitance, resonant frequency, etc.), inductor tests, hipot tests, etc.

Detailed instructions, with item number references to the drawing(s) should be included in the "Heath-Kit" manner. In-process tests, at the various stages of assembly, will be necessary in most cases. This would include tests to insure proper bonding for glue joints where applicable. Any test requiring impedance or admittance locus plots, should be supplemented by including standard plots with tolerances on resonant frequency, Q value, etc. These plots would be included in Section 9 along with the other drawings.

SECTION 7. HYDROSTATIC PRESSURE TESTS

This section should include the specified pressure tests required for acceptance by the Navy. This usually would involve cycling times and maximum pressure, insulation resistance measurements at high and low pressures, etc.

SECTION 8. CALIBRATION

This section should contain all calibration specification requirements imposed on the transducer including allowable tolerances. It should also specify the conditions under which the calibration is performed (free field, required depth, etc.). Standard impedance/admittance locus plots should be provided as a basis of comparison for impedance measurements and should be included in the drawing section (Section 9).

Following calibration (Section 8) should be a data sheet to record the significant measured values from the In-Process Tests, Hydrostatic Pressure Tests, and Calibration Tests performed on the transducer. A sample data sheet is included.

SECTION 9. DRAWINGS

This section should contain the necessary drawings to enable the technician to visualize the component interconnections necessary for proper disassembly and reassembly. The various parts should be identified with index numbers (which are referenced in the text). The drawings could be exploded view type or assembly view type; both, may be needed if the element is sufficiently complex. The main drawing(s) should be foldout type with blank aprons and with the itemized parts list included on the right side of the art. This figure should be the last page of the procedure so that disassembly/assembly illustration and part identification will always be available without making the technician shuffle back and forth in the text. The parts list should include all of the following if available:

ITEM #	IDENTIFYING # OR MANUFACTURER'S PART #	DESCRIPTION
number identifying part on drawing and in text	Military Part #, Report # Mfgrs. Part #, Standard Navy Stock Number (SNSN), etc.	Common name or dimensions of part

QUANTITY	CIRCUIT SYMBOL	FSN
Length, weight, or number used.	Military reference designation, such as MP-711, Y-1001, etc.	Federal Stock Number

All other necessary drawings, such as standard circles, supplementary wiring diagrams, special fixture details, etc., should also be included in Section 9.

Additionally, if any supplementary information or procedures are needed for proper restoration of the element and cannot logically be presented in the first nine sections, they may be included as additional sections.

DATA SHEET FOR TR-193/UQC-1

	TEST	SECTION	LIMITS	MEASURED VALUE
(U)	ASSEMBLY	2.2.6		YES___
	ADMITTANCE LOCUS	2.2.6.1.2	DISTORTION	_____ NO ___
	CAPACITANCE	2.2.6.1.3	0.045 uF - 0.055 uF	_____
	DISSIPATION FACTOR	2.2.6.1.3	0.02 MAXIMUM	_____
(U)	TRANSFORMER TESTS	2.2.6.2		
	TURNS RATIO AT 9.25 kHz	2.2.6.2.1	10:1 ± 5%	_____
	HIPOT AT 6 Hz	2.2.6.2.2	2000 V RMS FOR 1 MINUTE	_____
(U)	HYDROSTATIC PRESSURE TESTS	2.2.7		
	WHITE CABLE LEAD TO GROUND	2.2.7.4,5	50 MEGOHMS MINIMUM	_____
	BLACK CABLE LEAD TO GROUND	2.2.7.4,5	50 MEGOHMS MINIMUM	_____
	SHIELD TO GROUND	2.2.7.4,5	1 MEGOHM MINIMUM	_____
(U)	CALIBRATION	2.2.8		YES___
	ADMITTANCE LOCUS	2.2.8.1	DISTORTION	_____ No ___
	FREQUENCY OF MAXIMUM G	2.2.8.1	8.5 - 9.5 kHz	_____
	ADMITTANCE AT MAXIMUM G	2.2.8.1	25 MILLIMHOS +33% -20%	_____
	AZIMUTHAL BEAM PATTERN	2.2.8.2	±1.5 dB OF A PERFECT CIRCLE	_____
	TRANSMITTING RESPONSE	2.2.8.3	+38 dB//UBAR/VOLT MINIMUM	_____

SERIAL # OF ELEMENT ___ _____